

WHAT IS CLAIMED:

1. A method of transferring files between a computer onboard a train and remote stations comprising:

determining if a remote station is within range;
establishing wireless communication between the on-board computer and the remote station; and
determining whether the computer has files to be transferred and transferring the files to the remote station.

2. A method according to claim 1, including determining whether the remote station has updates to be transferred and transferring the updates to the on-board computer.

3. A method according to claim 2, wherein the updates include one or more of software updates for the on-board computer, operational data and callbook that defines with which remote stations the onboard computer will initiate communication.

4. A method according to claim 2, wherein determining whether the remote station has updates to be transferred includes comparing the version in the on-board computer to the version in the remote station and transferring only the additions, changes, and deletions resulting between the comparison.

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5. A method according to claim 1, wherein determining if a remote station is within range includes determining location of train and location of next remote station.

6. A method according to claim 1, wherein determining if a remote station is within range includes transmitting a wireless query and monitoring for a response.

7. A method according to claim 1, wherein, after an interruption of wireless communication, file transfers may be resumed during one or more subsequent communication sessions until all files have been received successfully.

8. A method according to claim 1, wherein the files includes data from an event recorder connected with the on-board computer.

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9. A method according to claim 8, wherein the train includes plural event recorders and including transferring data from each of the event recorders to the on-board computer.

10. A method according to claim 8, wherein the train includes plural event recorders connected to a respective on-board computer; and

the method includes establishing wireless communication between the on-board computers and the remote station, and transferring event recorder data from each of the on-board computers to the remote station.

a 11. A method according to claim 1, wherein the files includes one or more of train performances data and track data.

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EI 12. A method according to claim 1, including transferring the files from the remote station to a simulator;

operating the simulator with the transferred files; and

adjusting parameters of the simulator until data of the simulator matches data from the file.

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Simulation
54304 13. A method according to claim 12, wherein the parameters include one or more of grade resistance, curve resistance, rolling resistance, tractive effort of the trains's locomotives, dynamic brake effort of the locomotives, pneumatic brake system, and train weight.

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EI 14. A method according to claim 12, analyzing the data from the files on the simulator after adjusting of the parameters.

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15. A method according to claim 1, including establishing communication between the remote station and a home base station; and determining what files have to be transferred and transferring the files.

16. A method according to claim 15, wherein the files to be transferred from the home base station to the remote station includes one or more of software updates for the remote station, software updates for the onboard computer, operational data for the onboard computer, and a callbook that defines with which remote stations the onboard computer will initiate communication.

17. A method according to claim 15, wherein the files to be transferred from the remote station to the home base include one or more of files received from the on-board computer and files including operation information of the remote station.

18. A method according to claim 17, wherein operational information includes one or more of: locomotives contacted, which software updates were transferred, which onboard computer files were received, and communication statistics.

19. A method according to claim 15 wherein communication is established between the remote station and the home base when one or more of remote station has new files from the on-board computer, home base has new software for the remote station or on-

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board computer, requested by user and according to a schedule.

20. A method according to claim 1, including establishing communication between two remote stations; and determining what files have to be transferred and transferring the files.

21. A method according to claim 20, establishing communication and transferring files between remote stations for all the remote stations in a subnet.

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22. A method of transferring files between a remote station and a home base station, comprising:
 responding to various trigger events to determine that a transfer is needed;
 establishing communication between the remote station and the home base station; and
 determining what files need to be transferred and transferring the files.

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23. A method according to claim 22, wherein the files transferred to the remote station includes a callbook that defines with which remote stations a computer on board a locomotive will initiate communication.

24. A method according to claim 22, wherein the files transferred to the remote station include one or more updates to be installed on the remote station and

updates to be transferred to and installed on a computer on board a locomotive.

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25. A method according to claim 24, wherein determining whether the home base station has updates to transfer to the remote station includes comparing the version in the remote station with the version in the home base station.

26. A method according to claims 22, wherein trigger event for the transfer of a software update includes a new software version being submitted to the home base station.

27. A method according to claim 22, wherein the files transferred to the home base station includes one or more of files received by the remote station from a computer on board a locomotive and operational information about the remote station.

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28. A method according to claim 27, wherein the operational information includes one or more of: locomotives contacted, which software updates were transferred, which onboard computer files were received, and communication statistics.

29. A method according to claim 27, wherein the home base station uses the onboard computer files for one or more of: analysis, playback, report generation, archival, and backup.

30. A railway communications network for transferring files between computers on board locomotives, and remote stations comprising:

at least one locomotive having an on board computer;

a group of remote stations connected together in a subnetwork and each including a server for files; and

a communication device on the locomotive communicating only with remote stations of its subnetwork.

31. A network according to claim 30, including a plurality of railroad subnetworks grouping together remote stations and onboard computers according to criteria that include the territorial boundaries or operating ranges of a particular railroad, subdivision, or other entity.

32. A network according to claim 31, wherein the onboard computer includes a callbook with defines the remote stations on its own subnetwork.

33. A network according to claim 31, wherein the onboard computer includes the ability to communicate with one or more remote station on one or more "foreign" subnetworks.

34. A network according to claim 31, wherein a remote station includes a callbook which defines the

other remote stations on its own subnetwork with which it can communicate.

35. A network according to claim 31, wherein a remote station includes the ability to communicate with a remote station on a "foreign" subnetwork when a foreign locomotive transfers files to it.

36. A network according to claim 31, wherein the subnetwork includes the ability to electronically reconfigure itself when a remote station is added to or removed from the subnetwork.

37. A method of adjusting a simulator comprising:

inputting the data from a train into the simulator;

operating the simulator with the data; and

adjusting automatically parameters of the simulator until data of the simulator matches the data from the train.

38. A method according to claim 37, wherein the parameters includes one or more of grade resistance, curve resistance, rolling resistance, tractive effort of the train's locomotives, dynamic brake effort of the locomotives, pneumatic brake system, and train weight.

39. A method according to claim 37, including analyzing the inputted data on the simulator after adjusting of the parameters.

40. A method according to claim 39, wherein the analysis includes identifying anomalies in the inputted data and reporting the anomalies.

41. A method according to claim 37, adjusting the parameters includes comparing the simulator data and the train data during a change of velocity.

a 42. A method according to claim 37, wherein the train data is from an event recorder on the train and adjusting the parameters includes comparing the simulator data and the event recorder data during one or more trip features including: curves; grades; braking and throttle changes.

43. A method according to claim 37, wherein the train includes plural event recorders storing the train data and including inputting data from each of the event recorders into the simulator and operating the simulator and adjusting the parameters using the data from all the event recorders.

44. A method according to claim 37, including providing a simulator on the train.

45. A method according to claim 44, including storing the adjusted parameters with the data of the train on an event recorder on the train.

Sub E1 46. A method according to claim 1, wherein one of the remote stations includes track data; and including transferring the track data to the on-board computer and subsequently transferring the track data from the on-board computer to another remote station.

47. A method according to claim 46, including displaying the track data on the train.

48. A method according to claim 46 wherein the track data includes one or more of signal aspect, crossing gate position, crossing occupancy status, and other trains in the vicinity.

49. A method according to claim 46 including correlating train performance data with track data.

Sub B1 50. A method of transferring files from remote stations along a railroad track to a base station comprising:

establishing communication between a computer on a train and remote stations as the train moves along the track;

transferring files from the remote stations to the on-board computer;

establishing communication between the on-board computer and the base station; and

subsequently transferring files from the remote station from the on-board computer to the base station.